9-1998

Iowa Mammals -- Iowa Wildlife Series

Iowa Association of Naturalists

Iowa Mammals

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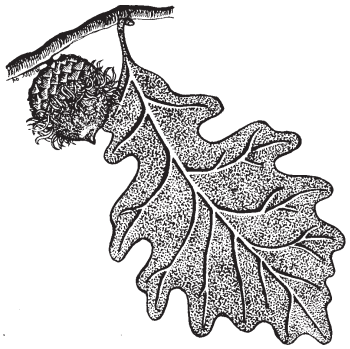

Iowa Association of Naturalists

The Iowa Association of Naturalists (IAN) is a nonprofit organization of people interested in promoting the development of skills and education within the art of interpreting the natural and cultural environment. IAN was founded in 1978 and may be contacted by writing the Conservation Education Center, 2473 160th Rd., Guthrie Center, IA 50115, 515/747-8383.

Iowa Wildlife Series

Students need to be knowledgeable about and appreciate local wildlife in order to better understand the natural environment. The Iowa Association of Naturalists has created this series of booklets to offer a basic understandable overview of Iowa wildlife. These booklets will assist educators in teaching students about Iowa wildlife. The six booklets in this series are:

Iowa Mammals (IAN-601)
Iowa Winter Birds (IAN-602)
Iowa Nesting Birds (IAN-603)
Iowa Reptiles and Amphibians (IAN-604)
Iowa Fish (IAN-605)
Iowa Insects and Other Invertebrates (IAN-606)

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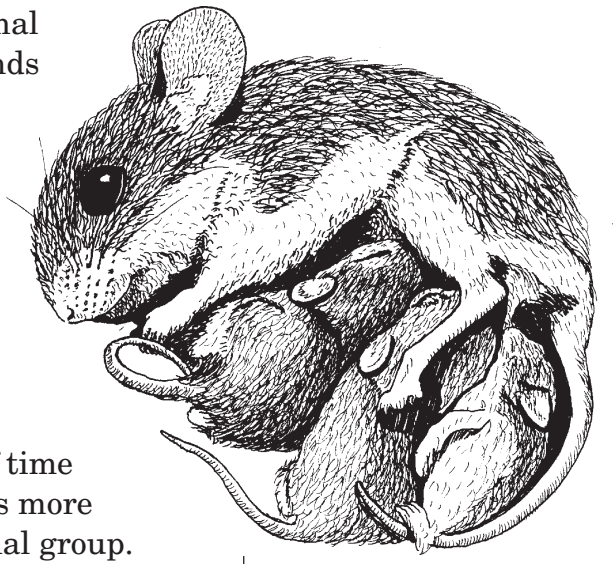
Iowa Mammals

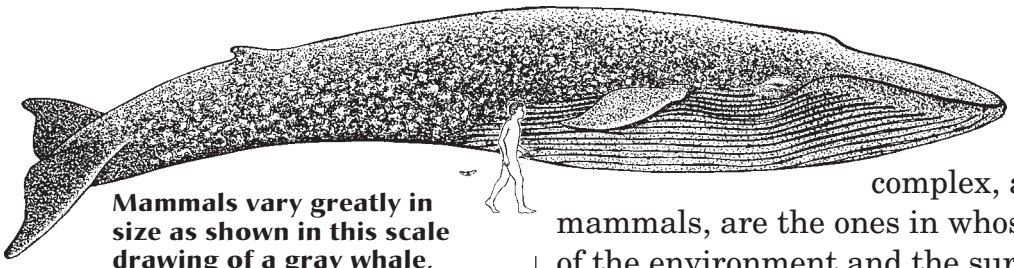
What is a mammal?

Mammals are among the most interesting and popular of all Earth's animals. The term mammal refers to the female's mammary glands which produce milk to nourish her young. The presence of mammary glands and hair distinguish mammals from other warm-blooded, back-boned animals. With some rare but notable exceptions, mammals are hairy and have teeth. The young are born alive and are cared for by at least one parent for an extended period of time after birth. The mammalian brain is more complex than that of any other animal group.



Mammals have lived in North America for about 190 million years, appearing shortly after the appearance of the dinosaurs. Their unique ability to adapt to changing seasons, climates, and food sources allowed them to survive even through the ice ages.

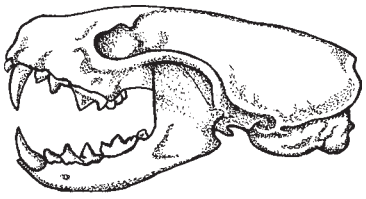
Today, mammals live on all continents and in all oceans. They are adapted to an incredible variety of lifestyles and habitats. Mammals can fly, glide, run, jump, crawl, swim, burrow, and dive. Worldwide, they range in size from the two-inch, 1/14- ounce bumblebee bat to the 100-foot, 115-ton blue whale. Their adaptations for survival have made them successful and dominant among

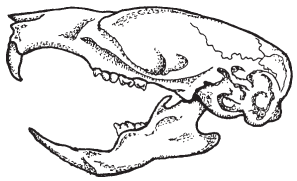


Mammals vary greatly in size as shown in this scale drawing of a gray whale, person, and brown bat.

Earth's life forms. And it is possible that humans, the most adaptable, complex, and successful of the mammals, are the ones in whose hands the quality of the environment and the survival of all other species may be held.

Mammalian teeth are among the most specialized in the animal kingdom. The size, shape, and arrangement of teeth not only help determine the mammal's diet but also often may be used to identify the particular species of mammal. Most mammals are born with baby teeth called **milk teeth** which eventually are replaced by permanent teeth. In general, mammals which are primarily plant-eaters or **herbivores** have sharp, front teeth for cutting vegetation and back teeth with broad, flat surfaces for grinding the food prior to swallowing. The diet of **carnivores** consists primarily, although not entirely, of meat. Therefore, carnivores have sharp **canine teeth,** often called fangs, for grabbing and tearing the flesh of other animals. **Omnivores** are animals with a varied diet that includes both plant and animal material. Omnivores have patterns of teeth with characteristics of both herbivores and carnivores.





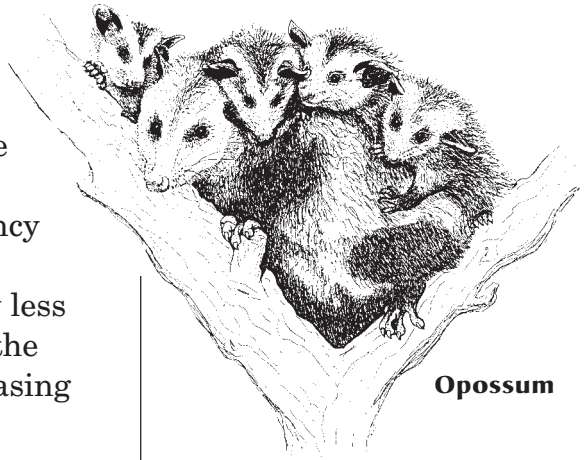
The carnivore skull (top) is equipped with canine teeth and sheering molars, while the herbivore skull (bottom) has sharp front teeth for cutting vegetation.

Mammals can be active at any time of the day and year. Many wild mammals must hunt without being detected by the **prey** they hunt**.** The hunters are called **predators** and often avoid mid-day hours for that reason. Night-active mammals are called **nocturnal**, while mammals active during the day are called **diurnal**. Mammals that are most active at dawn and dusk are called **crepuscular.**

Families of mammals living in Iowa

The combination of physical characteristics, special adaptations for survival, and unique behaviors are used to distinguish the families and species of mammals from one another.

The pouched mammals: marsupials



Opossum

The pouched mammals, or **marsupials**, are sometimes referred to as **primitive**. This simply describes the complexity and efficiency of some of their physical and behavioral adaptations. It does not mean they are any less successful. In fact, Iowa's only marsupial, the opossum, is among the few mammals increasing their numbers and expanding their range. Opossums, which are nocturnal, are found throughout the Iowa in woodlands and near waterways.

In addition to the pouch in which newly-born animals find protection and nourishment, opossums have 50 very similar teeth, furless ears and tail, and a **prehensile** tail. The prehensile tail is unusually strong and muscular and can be used almost as another limb. Unlike what is often portrayed in nature movies, however, opossums do not hang by their tails.

The insect-eating mammals—insectivores

Eastern mole

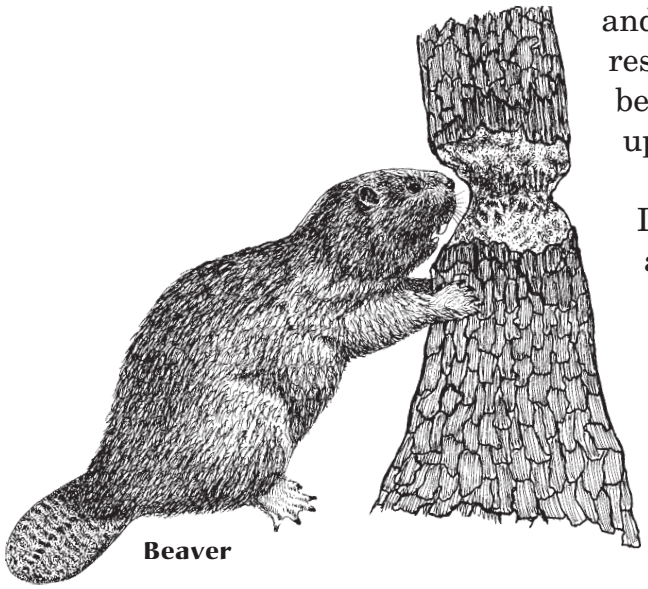
Moles and shrews make up the family of mammals known as **insectivores**, or insect-eaters. These animals generally live in grass, woodlands, and other

areas with deep, loose soils. Their teeth are not highly specialized and usually have just one **cusp,** or point at the top. The insect-eaters have small eyes but a very sensitive sense of touch. They are all predators and capable of burrowing through the soil in search of their prey. Moles hunt grubs and soil insects. They have thick fur and forelimbs adapted to digging through the soil to find their food. Shrews hunt worms, snails, spiders, and insects. Shrews often have a poison in their saliva which is believed to help them kill prey nearly as big as the shrew itself. Their metabolic rates are so high that they must eat almost constantly to sustain themselves.

The eastern mole, the star-nosed mole, masked shrew, pygmy shrew, least shrew, and short-tailed shrew are found throughout Iowa. The status of the star-nosed mole and least shrew is unreliable and uncertain. It is possible that they do survive in undisturbed areas of moist, woodland habitat.

The gnawing mammals—Rodents

Rodents characteristically have only two **incisors,** or front teeth, and no canine teeth. The incisors of the upper jaw are especially large and chisel-shaped. The lack of canine teeth results in an open space called a **diastema** between the incisors and molars in both the upper and lower jaws**.**



Beaver

In both numbers of species and numbers of animals, rodents are the most numerous of Iowa's wild mammals. Their numbers, combined with their ability to produce many young in a short period of time, make them an abundant and stable prey for many species of predators. Members of the rodent family found commonly throughout Iowa are listed here.

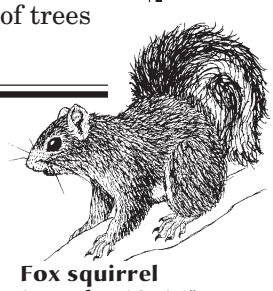
Common rodents found throughout Iowa

Common name	Distinguishing characteristics
White-footed mouse	Brown back; white belly and feet
Deer mouse	Brown back; white belly and feet; tail sharply bicolored; top brown and bottom white
Southern bog lemming	Short tail; brownish-gray fur
Prairie vole	Gray back; yellowish belly; shorter tail and nose than a mouse
Meadow vole	Gray back; silver belly; shorter tail and nose than a mouse
Meadow jumping mouse	Tail much longer than body; big feet; brown back; yellow sides; white belly
Western harvest mouse	White feet; yellowish-brown fur
House mouse	Naked, scaly tail; grayish both back and belly; not native to Iowa; found close to human habitations
Norway rat	Grizzled fur; naked and scaly tail; found close to human habitations; not native to Iowa
Thirteen-lined ground squirrel	Many alternating solid and broken lines on back; common in short grass, golf courses, and roadsides
Franklin's ground squirrel	Mottled gray fur; found in taller grasses
Eastern chipmunk	Long tail; facial stripe; two to four dark stripes on back
Fox squirrel	Bushy tail with orange-tipped hairs; Iowa's largest squirrel
Gray squirrel	Bushy tail with gray hairs
Woodchuck	Heavy body; dark feet; dark bushy tail; also called groundhog
Plains pocket gopher	Heavy body; stumpy tail; big front claws; external cheek pouches
Muskrat	Long, naked tail which is flattened side to side; dense brown fur; aquatic; builds lodge of cattails and grasses or a hole in the bank
Beaver	Naked tail which is flattened top to bottom; dense brown fur; larger than muskrat; aquatic; builds lodge of trees and sticks or a hole in the bank

Gray squirrel
Length: 8–10″

Franklin's ground squirrel
Length: 8–10″

Thirteen-lined ground squirrel
Length: 4–6″



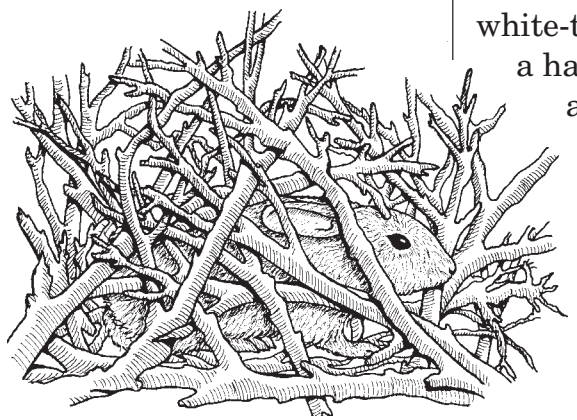
Fox squirrel
Length: 10–15″

Less common rodents found in Iowa

Name	Distinguishing characteristics	Status
Red squirrel	Smaller than other squirrels; red above; white below; becoming more rare	Found in northcentral and northeast Iowa forests
Southern flying squirrel	Bushy tail; large membrane between front and hind legs;	Southeast 2/3 of state; rare; sensitive to loss of woodlands
Woodland vole	Short tail; hard to distinguish from prairie vole	Endangered; needs old, wet woodlands
Red-backed vole	Reddish fur on back; short tail; ears not noticeable	Endangered; needs wet woods and bogs
Grasshopper mouse	Short, stocky, prairie dweller; very plush fur	Endangered; Northwest Iowa only

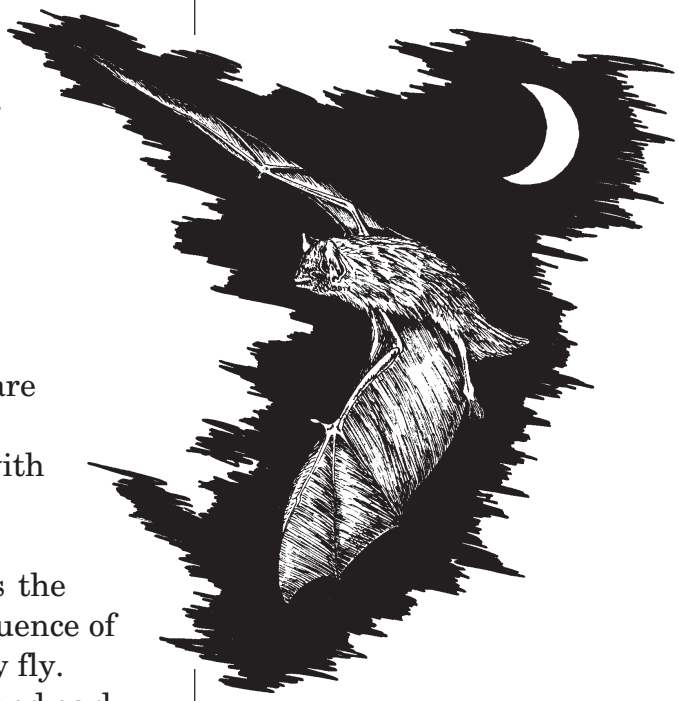
Rabbits and hares: lagomorphs

Wild rabbits resemble rodents at first glance because, like rodents, they have a pair of large, chisel-like front teeth and no canines. As with rodents, the lack of canine teeth creates a space called a diastema. However, a pair of small, inconspicuous incisors immediately behind the front incisors is one feature that distinguishes rabbits from rodents.



Two species of rabbits live in Iowa - the eastern cottontail rabbit and white-tailed jackrabbit. The white-tailed jackrabbit is actually not a rabbit but a hare. It is locally common mainly in western and northern Iowa. Both rabbits and hares make their living by eating a variety of plant material. The primary difference between rabbits and hares is that rabbits give birth to blind, nearly-naked young, while hares give birth to young who are fully covered with fur and have open eyes. Distinguishing between these two species

is relatively easy. The much more common eastern cottontail rabbit is brownish-gray throughout the year. Its ears are less than three inches in length and its hind feet are less than four and one-half inches in length. The white-tailed jackrabbit has much longer ears and feet and has a winter coat of nearly pure white for camouflage in the snow. Its large feet allow it to flee predators quickly in winter by acting like snowshoes.



The flying mammals: bats

The only true flying mammals in Iowa are bats. Bats have expansive membranes connecting their forearms and fingers with the sides of their bodies and their hind limbs. In many species, this thin membrane extends to the rear and includes the tail. Rather than gliding under the influence of gravity, as flying squirrels do, bats truly fly. Usually bats fly at night, late evening, and early morning. They find their way and their prey through the use of **echolocation** - a sonar-like system of sending clicking sounds and listening for the echo.

There is probably no group of animals more feared and misunderstood than bats. Contrary to myth, bats do not dive in your hair, bite your neck, suck your blood, or carry off small children. Although some do not see well, bats are not blind. There are vampire bats, but they prey mostly on cow's blood and are found only in South America - not in Iowa. Iowa bats are the size of a mouse or smaller and weigh about half an ounce.

In Iowa, bats' most important contribution to the environment and our well-being and comfort is the

fact that they eat lots of insects. A single bat is capable of eating up to 2,000 mosquitoes on a warm, summer Iowa evening. Bat populations are declining statewide for a variety of reasons. Use of chemical pesticides to kill insects has reduced their available food. And loss of woodlands and increased human traffic in caves have decreased the availability of suitable shelter.

There are nine species of bats known in Iowa. Some can be difficult to identify.

Common bats found throughout Iowa

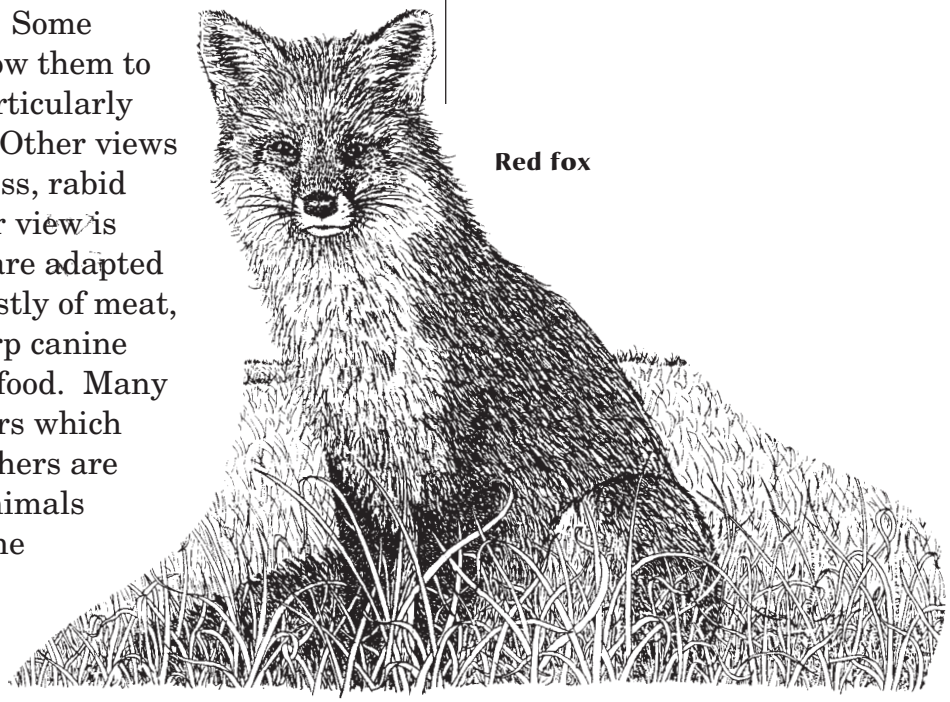
Common name	Distinguishing characteristics
Little brown myotis	About one-half the size of a mouse; chocolate-brown fur; no fur on wings; weighs about 1/4 ounce; hibernates in caves and unheated attics in the winter
Big brown bat	Mouse-sized; bronzy-brown fur; naked wings and tail; found more often in attics, chimneys, and hollow trees
Red bat	Wing and tail membranes heavily furred; reddish-orange fur; roosts in trees and woodland areas
Hoary bat	Wing and tail membranes heavily furred; fur yellow-brown with white tips; roosts in trees
Silver-haired bat	Wing membranes heavily furred especially near tail; fur has a silver-colored tint; prefers woodlands

Less common bats found in Iowa

Common name	Distinguishing characteristics	Status
Indiana bat	Hard to tell from other small bats; belly fur pinkish-gray at tips; hibernates in caves in winter; spends Iowa summers in groups often under the loose bark of old trees	Endangered
Eastern pipistrelle	One-half the size of a mouse; yellow-brown fur; dark reddish-brown wings; each strand of fur distinctly tricolored	Found in eastern 3/4 of Iowa
Evening bat	Chocolate-brown like big brown bat but much smaller; very small ears; found in attics	Threatened; southeast 1/3 of Iowa; summer only
Keen's myotis	Chocolate-brown like little brown myotis but with much longer ears; found in caves	Threatened; southeast 1/4 of Iowa

The flesh-eating mammals: carnivores

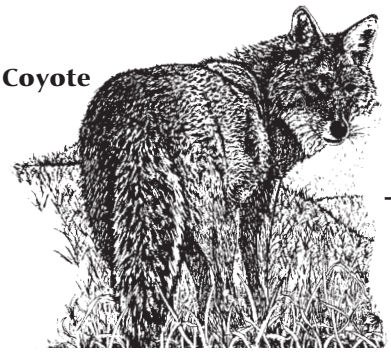
The flesh-eating mammals, or **carnivores**, are both among our most favorite and least favorite animals. Some views of carnivores show them to be cute and cuddly, particularly when they are young. Other views portray them as ruthless, rabid killers. In fact, neither view is accurate. Carnivores are adapted to a diet consisting mostly of meat, so they have long, sharp canine teeth for tearing their food. Many carnivores are predators which actively hunt prey. Others are **scavengers,** eating animals which have died in some other way.



Red fox

We often have difficulty separating the myths and stories about carnivores from reality. Hence, Wile E. Coyote, the Big Bad Wolf, and the Three Bears (of Goldilocks fame) are given an unfairly bad reputation, while Bambi is often protected, at all cost, as the unwary victim.

Like humans, carnivores need food, clean water, suitable shelter, and enough space in which to live. Larger predators need large spaces in which to hunt and, in general, have not adapted well to the fragmentation of their habitat by urban sprawl and agricultural practices. Like humans, carnivores have fewer young. These young require a longer period of care by the parents. Carnivores are known to be instinctively good parents and very caring and defensive of their young.



Coyote

Common carnivores found throughout Iowa

Common name	Distinguishing characteristics
Coyote	The weight of a medium-sized dog; bushy tail; coarse rusty-colored fur; tail tip dark
Red fox	The weight of a large cat; long, soft rusty-colored fur above; whitish fur on belly; fluffy tail
Gray fox	Similar in size to a red fox; long, soft rusty-colored fur on legs and ears; grizzled gray fur on back; climbs trees
Raccoon	Characteristic mask; long tail alternately banded with black; grizzled black and brown fur
Least weasel	At only six inches, it is the smallest carnivore; short tail without a black tip; chocolate-brown back in summer; white in winter; white feet
Mink	Weight comparable to a small cat; chocolate-brown fur with white chin; typical long and flexible weasel-shaped body
Badger	Large, heavy-bodied member of the weasel family; white stripe on head; large forefeet with long claws for burrowing
Striped skunk	Black fur with one or two long white stripes; known for using scent glands under tail as a defense when threatened

Less common carnivores found in Iowa

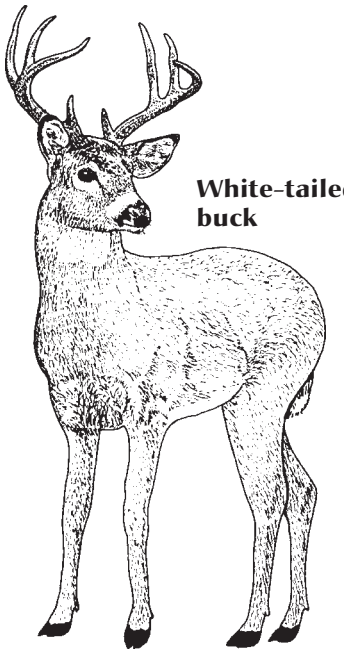
Common name	Distinguishing characteristics	Status
Bobcat	Sharp, retractable claws; tan to rusty fur but with dark streaks and spots; tufts on ears; very secretive	Uncommon but found in suitable woodland habitat
Spotted skunk	Also known as civet cat; black with white broken markings	Once common but declining statewide
River otter	Large, dark, weasel-shaped body; small ears; webbed feet	Reintroduced in select locations
Ermine	Also known as short-tailed weasel; brown in summer; white in winter with black-tipped tail and white feet	Rare; only found in northeast half of Iowa; status undetermined
Long-tailed weasel	Similar in color but slightly larger than ermine; without white feet	Rare but found throughout Iowa

The hoofed mammals: ungulates

All mammals have claws or toenails composed of a protein-like substance called **chitin**. The hoofed mammals have either one or two prominent, large toes upon which they walk or run. The other toes may be present, but they are reduced in size and inconspicuous. There are two large subgroups of hoofed mammals - even-toed hoofed mammals and odd-toed hoofed mammals.

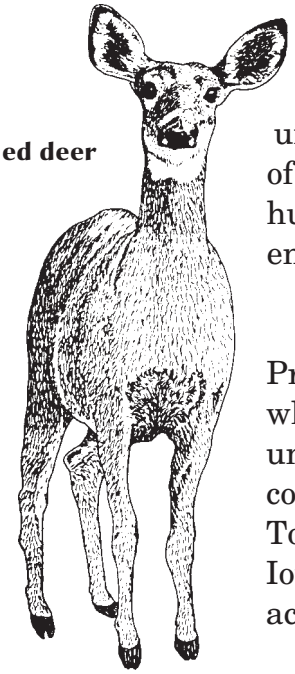
Odd-toed hoofed mammals walk on a single, central front toe. Examples of odd-toed, hoofed mammals are the horse and rhinoceros. There are no wild, odd-toed hoofed mammals found in Iowa.

The even-toed hoofed mammals walk on two prominent toes. The commonly recognized track of the white-tailed deer demonstrates this characteristic. Members of this family found in Iowa include such livestock animals as cattle, pigs, sheep, and goats. Although numbers of livestock animals in Iowa are higher even than human numbers, discussion here will be limited to Iowa's wild, even-toed hoofed mammals. The only wild member of this family still living wild in the state is the white-tailed deer. Elk, moose, and bison are even-toed hoofed mammals that no longer live in the wild in Iowa.



White-tailed deer buck

The white-tailed deer is among the most recognizable and important species of wild mammals in Iowa. It is the only hoofed mammal common throughout the state. White-tailed deer adapt well to edges between natural communities and edges of towns and farms created by human habitation. Deer numbers generally are increasing, especially



White-tailed deer doe

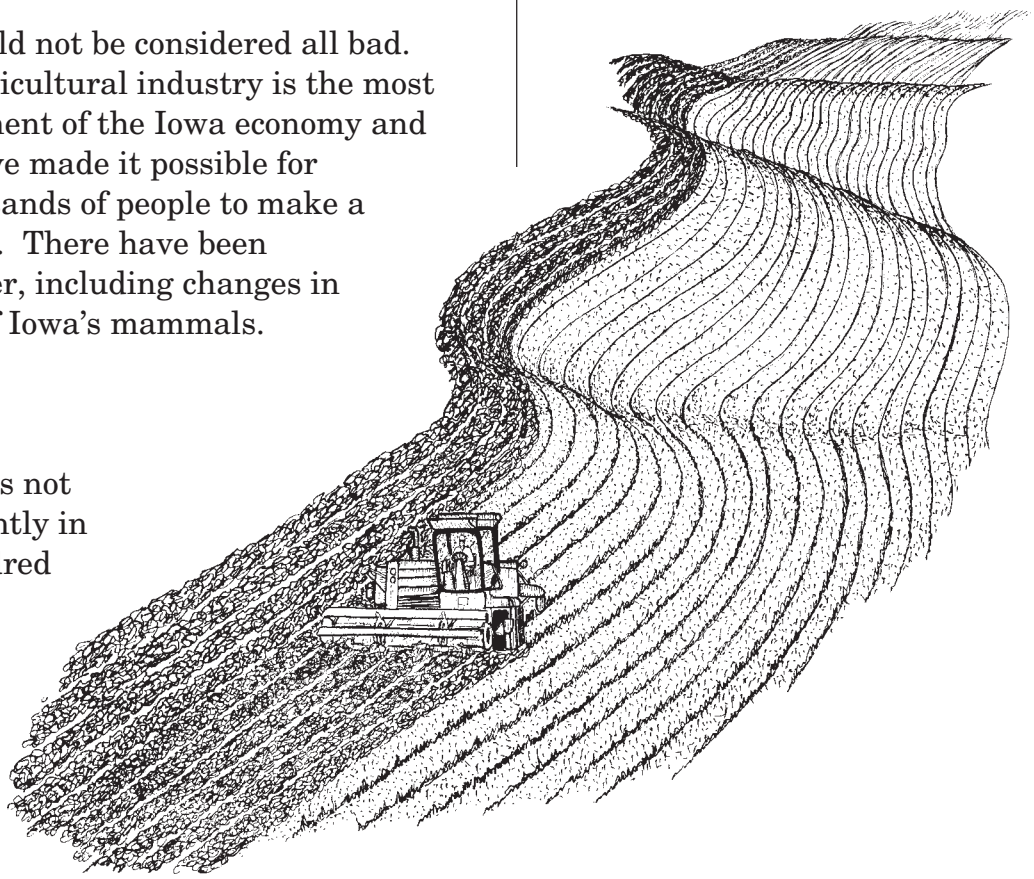
near agricultural and residential areas. The same myths, misconceptions, and lack of understanding that perpetuate fear and hatred of predators also create tension among Iowa's hunters, farmers, homeowners, and wildlife enthusiasts.

Prior to the European settlement of Iowa, white-tailed deer were common. Due to uncontrolled market hunting, deer were completely eliminated from the state by 1900. Today, white-tailed deer have been restored to Iowa. Hunting and other measures are used to actively manage deer populations.

Unique adaptations to life in Iowa

Prior to settlement, Iowa was mostly tallgrass prairie. There were extensive wetlands and wet prairies in the north-central part of the state and woodlands along its numerous waterways. With settlement, most of the prairie and wetlands were destroyed. It's possible that Iowa has just as many trees as it did prior to settlement. However, our original extensive, contiguous acres of woodlands have been fragmented by agricultural practices and urban development. These changes have had enormous impacts on Iowa's ecosystems.

The changes should not be considered all bad. Certainly, our agricultural industry is the most important component of the Iowa economy and these changes have made it possible for hundreds of thousands of people to make a living in the state. There have been trade-offs, however, including changes in the populations of Iowa's mammals.



One thing that has not changed significantly in the past few hundred years is Iowa's climate. Iowa still enjoys incredible seasonal changes, from hot and humid in the summer to snowy and cold in the winter. Mammals still living in Iowa have had to adapt to the presence of humans, develop diets composed of many different foods, and tolerate extreme changes in the weather.

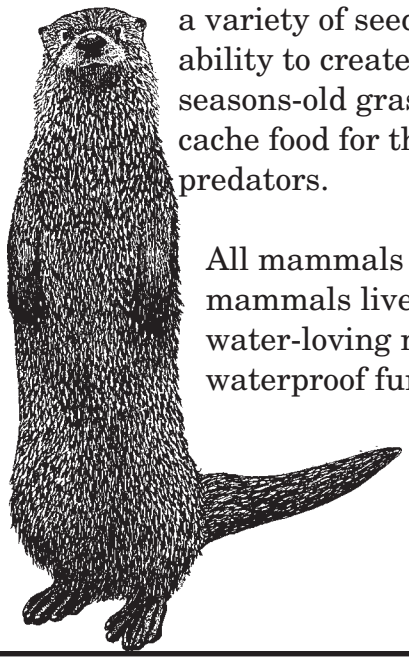
Chipmunks, squirrels, coyotes, and raccoons have adapted well to Iowa woodlands. Their darker coloration camouflages among the shadows. They have comparatively small home ranges, so they are able to tolerate forest fragmentation. Their broad range of foods and ability to help themselves at birdfeeders, fields of agricultural crops, and backyard wildlife plantings help them survive.

Eastern chipmunk

Hibernating woodchuck

Hibernation is one of many adaptations to the cold and decreased food supplies of Iowa winters. Most mammals, including people, tend to slow down a little during the winter. True hibernators actually curl into a tight ball and reduce to extremely low levels their heart and breathing rates, body temperature, and metabolism. They need less food to survive. Bats which eat insects have virtually nothing available to eat so they are forced to hibernate all winter. Other hibernators include woodchucks, ground squirrels, jumping mice, and a few other rodents. There are a number of mammals such as badgers, raccoons, chipmunks, and skunks which do not truly hibernate. They do, however, reduce their need for food by sleeping deeply for periods extending from a few days to two weeks.

Mice and voles are among the most abundant inhabitants of Iowa's fields and prairies. Most eat a variety of seeds and other plant materials. Their ability to create tunnels and runways through the seasons-old grasses near the ground allow them to cache food for the winter and escape voracious predators.

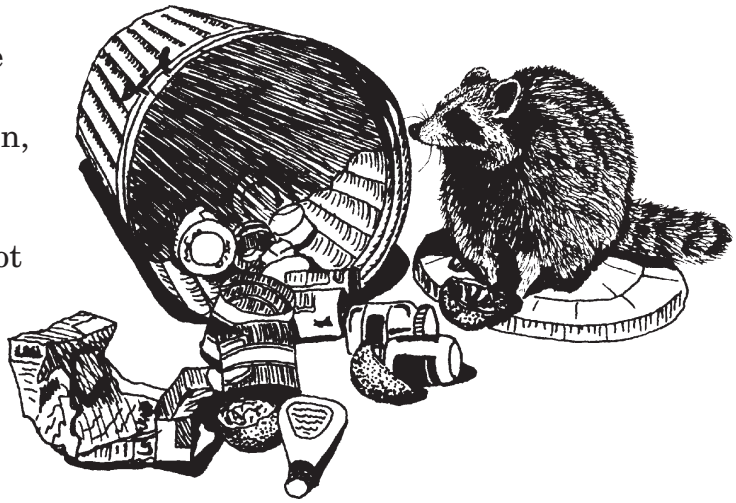


River otter

All mammals need water, and many Iowa mammals live in or near waterways. Iowa's water-loving mammals have uniquely thick and waterproof fur. This **pelt** insulates such animals as mink, otter, beaver, and muskrat. The thick fur of these animals often has relatively high economic value. One example is the river otter. Otters were

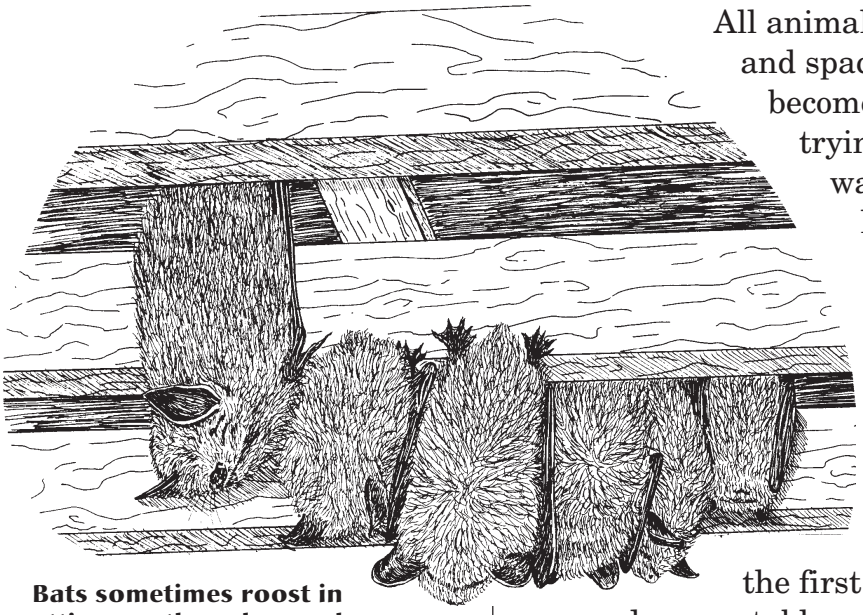
trapped to extirpation from Iowa's interior waterways because of their pelts. Their sleek bodies and webbed feet allowed them to successfully escape their natural predators, but they were no help in avoiding traps. Partnerships among several agencies and organizations have helped reintroduce river otters to Iowa's waterways to the delight of many Iowans lucky enough to catch a glimpse of these marvelous creatures.

Mammals as nuisances?



If Iowa's wildlife biologists were surveyed to determine the most commonly-requested information, it surely would be wildlife nuisance problems. The word **nuisance** is an opinion. It is not a fact of ecology. We tend to consider certain animals nuisances when they interact with people in ways we either don't like or consider dangerous.

Moles dig up our lawns. Deer and ground squirrels damage agricultural crops. Beavers build dams that flood land we don't want flooded. Rabbits and woodchucks invade our gardens. And bats spend the winter in our attics. These are among the most common wildlife nuisances. Damage to agricultural crops is a significant economic problem, and the threat of rabies is not just a nuisance but a real danger to our health. Most nuisances, however, are just nuisances. When examined carefully, most can be avoided or simply tolerated.



Bats sometimes roost in attics or other places where people do not want them.

All animals need food, water, shelter, and space. When an animal becomes a nuisance, it's simply trying to survive - sometimes in ways and places we don't like. An attic may look just like the inside of a large tree, a perfect place for a bat to roost or hibernate. Pet food on the kitchen floor may become a special treat for a deer mouse which found its way inside while escaping the first autumn frost. And garden vegetables are abundant and nutritious - not just for people.

While the nuisance activity of wildlife should be considered natural, that does not mean we have to accept the nuisance. Solving the problem successfully requires that we examine the problem and carefully consider possible solutions. Generally speaking, the use of poisons should be a last resort. Most poisons don't work on just one species, and accidentally harming people, household pets, and animals we do like is possible.

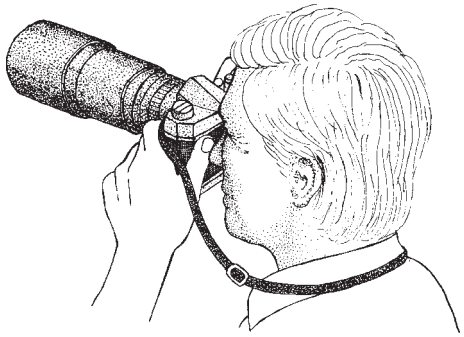
Rather than using poisons, consider removing access to the food and shelter they seek. Openings under the eaves or pipes entering the house are invitations to any animal that is looking for shelter. The solution is to close the openings. Pet food or garbage left in an accessible location is an invitation to any hungry animal. The solution is to clean it up, cover it, and don't give your pet more food than it can eat in one feeding. One solution to deer, rabbits, and woodchucks eating garden vegetables is to fence them out of garden areas.

There are numerous other nuisance wildlife situations and solutions. State, county, and extension wildlife biologists are well-prepared with objective research data, good information, and reasonable suggestions for solving your problems.

Economic impact of Iowa mammals

Rodents are of great economic importance in Iowa. Woodchucks, pocket gophers, ground squirrels, and chipmunks cause significant damage to field crops and gardens. Mice and voles cause considerable loss annually to orchards and tree nurseries by girdling young trees, particularly during the winter. Damage caused by the non-native Norway rat and efforts to control its infestation total millions of dollars annually.

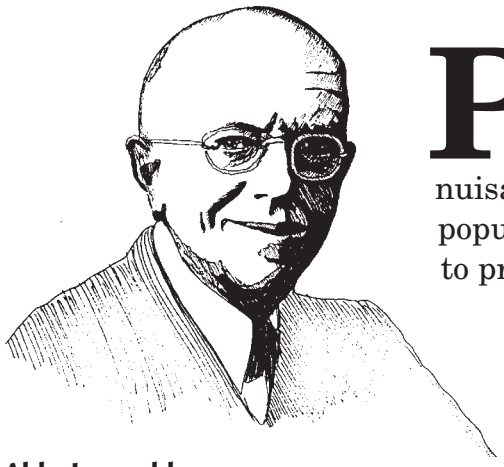
On the positive side of the economic coin are beaver, muskrats, and other furbearers which are trapped for their fur. Burrowing by ground squirrels, voles, and mice improves soil aeration and productivity. And the burrows of many rodents are used in turn by a variety of other animals for shelter.



The deer hunting industry in Iowa has incredible economic impact in this state. While increasing numbers of deer can be positive for wildlife watchers and deer hunters, tremendous damage to natural vegetation and agricultural crops caused by high deer populations has been documented.

The economic benefits of healthy wildlife populations are significant. Tourism and the resulting economic impacts from wildlife watching by non-hunters and purchase of licenses and equipment by hunters are tremendous. In addition, efforts to improve urban and backyard habitat and wildlife habitat on privately-owned lands have made a positive economic impact on such businesses as nurseries and sources for native grass seed. These same efforts do not just improve habitat for Iowa's mammals but also Iowa's birds, butterflies, insects, fish, amphibians, reptiles, and all the other creatures with whom we share the natural world.

Wildlife protection and management



Aldo Leopold

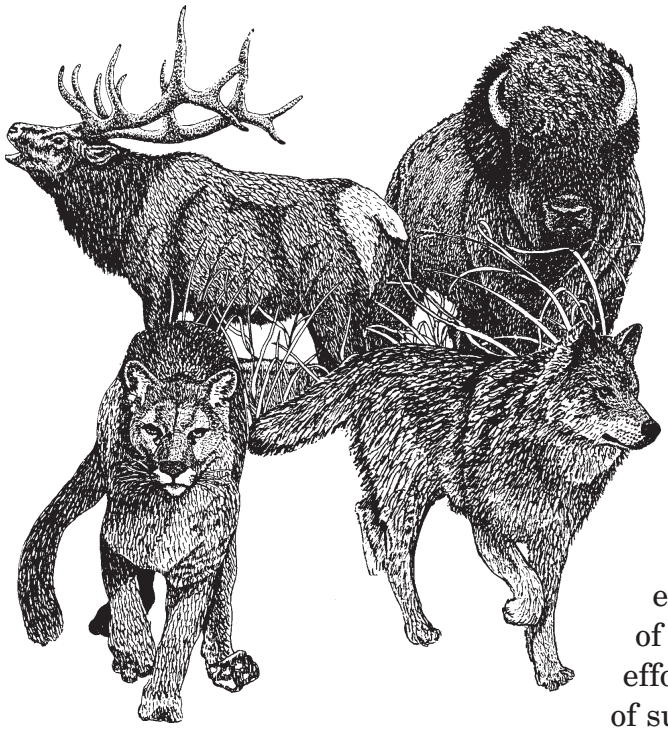
People continually learn more about how to manage wildlife habitat to improve biodiversity, to reduce nuisances, to favor animals whose populations we would like to expand, and to protect our most vulnerable species.

Interestingly enough, the individual often considered the Father of Wildlife Management - **Aldo Leopold** - was born in Iowa and did his first statewide game survey here. Leopold devoted much of his career to understanding not only the habitat needs of specific animals but also how those needs interacted and overlapped in a healthy natural community. Many currently accepted and applied wildlife management practices are directly attributable to Leopold's work.

In its early years, the science of wildlife management was focused primarily on increasing populations of game species. This was, in part, due to the fact that most of the work was conducted using hunting license revenues. Hunting license fees still fund most wildlife management work and hunters deserve the credit. However, research, better understanding of individual species, and advancements in the science of ecology have resulted in a broader view of the goals of wildlife management. One lesson learned from Aldo Leopold is that wildlife managers can't have just one goal, so wildlife managers today work diligently toward several goals, including habitat health, environmental quality, and wildlife diversity. This approach results in healthier, more sustainable populations of both game and nongame species.

Wildlife protection and management

Whether caused by the loss of suitable habitat or by a global disaster such as a comet impact, **extinction** is the complete disappearance of an entire species. There are several species of mammals once found in Iowa which have become extinct, including the giant ground sloth, giant beaver, American mastodon, mammoth, and giant bison. Many extinct mammals were ice age mammals that did not survive the transition to a warmer, temperate climate. Extinction is natural, but the rate of extinction has increased tremendously since people have begun to alter natural ecosystems.



Elk, bison, mountain lion, and gray wolf are examples of species extirpated from Iowa.

Iowa **Extirpated** species are those that were once found in Iowa, but no longer have breeding populations within the state. Species such as the musk-ox, porcupine, fisher, pine marten, wolverine, moose, and caribou prefer cooler climates and probably moved north out of Iowa as the post-ice age climate warmed.

The term extirpation usually refers to species more recently extirpated, usually as a direct result of changes caused by people. Past efforts at predator control or the loss of sufficiently large living spaces are usually the causes. Species considered extirpated from their former ranges in Iowa include the gray wolf, mountain lion, lynx, bison, and elk.

Wildlife benefits

"The last word in ignorance is the man who says of a plant or animal: 'What good is it?' If the land mechanism as a whole is good, then every part is good whether we understand it or not."

Aldo Leopold, A Sand County Almanac

The presence of wildlife in our backyards, our lives, and Iowa's natural areas is a sign that all is well with the environment. It could be argued that wildlife species deserve to live for their own sake and because they were here prior to Euro-American settlement. There is no need to argue which species are more important if we simply agree that all species have an important role to play in the natural world.

If a case must be made for the benefits of healthy wildlife populations, it is sensible to view the issue in terms of several different values. It is usually aesthetically pleasing to see deer grazing in a meadow on summer evening or to see squirrels hopping from tree to tree in a streamside woodland. The economic benefits of hunting and wildlife watching have been discussed previously. And the natural balance among predator and prey species in a healthy biological community reduces nuisance wildlife problems.

What can we do?

"The other reason for my optimism rests with the people of Iowa. Iowa has produced a lot of individuals - John Lacey, Aldo Leopold, Ira Gabrielson, and J.N. "Ding" Darling are just a few examples - who have gone on to become leaders in conservation efforts, both in Iowa and nationally. Certainly, with its strong education system and a growing concern for the environment, Iowa will continue to produce leaders who will find innovative ways to balance a concern for natural resources with the need to sustain the state's leading industry, agriculture."

- James J. Dinsmore, A Country So Full Of Game

Humans are the one species that can protect the quality and diversity of natural communities. The question is whether we can meet our needs for a high quality of life while sustaining wildlife populations, clean water resources, and productive soil for many generations to come.

Just as healthy communities are composed of diverse species and interrelationships, a sustainable environment is the result of diverse points of view and partnerships, all working together toward those same quality of life goals. The agricultural industry in Iowa is making the transition to a more sustainable way of doing business by finding a balance between economic and environmental health. Public and private businesses, organizations, agencies, and individuals are pooling limited human and financial resources simultaneously to solve water quality issues, improve wildlife habitat, and meet our economic needs.

There are several ways Iowans can protect wildlife populations and habitat. Participation in such governmental programs as the Conservation Reserve Program (CRP) or such organizations as Pheasants Forever, to mention just two, are positive ways of improving wildlife habitat. Iowa's **Chickadee Checkoff** option on Iowa income tax forms funds the Wildlife Diversity Program of the Iowa Department of Natural Resources. Chickadee Checkoff donations directly fund research, watchable wildlife opportunities, educational efforts, and species reintroduction programs.

Currently, the Wildlife Diversity Program is partnering with hundreds of businesses and agencies at the state and federal levels to improve

funding for these kinds of programs. This effort known as **Teaming With Wildlife** has tremendous potential for increased funding for many Iowa wildlife programs.

Finally, one of the best ways to support wildlife, habitat, and environmental programs is simply to get out and enjoy the natural world. Sometimes user fees are charged to visit certain areas or participate in certain programs. The user fees fund the continuation of these programs. By paying these fees, we support our interest and concerns for our natural resources. Demand by citizens and tourists for healthy and diverse and natural communities, wildlife watching opportunities, and areas and facilities for hunting will prove to governmental officials and policy-makers that we value these things. Hopefully, our demands will help such programs become higher priorities. And finally, there is no question that getting out and enjoying the natural world is good for us, our health, and our well-being.

Useful resources

Publications

A Country So Full Of Game; James J. Dinsmore; University of Iowa Press, Iowa City, Iowa; 1994.

A Fieldbook of Illinois Mammals; Donald F. Hoffmeister and Carl O. Mohr; Dover Publications, New York, NY; 1972.

A Guide to the Mammals of Iowa and Other North American Mammalian Families; W.L. Franklin; Department of Animal Ecology, Iowa State University, Ames, IA; 1978.

IAN Booklet Series; Iowa Association of Naturalists; ISU Extension Service, Ames, IA.

Misconceptions About Iowa Wildlife (IAN-403); Iowa Wildlife and People Series; 1996.

Iowa Food Webs and Other Interrelationships (IAN-405); Iowa Wildlife and People Series; 1996.

Adapting to Iowa (IAN 408); Iowa Wildlife and People Series; 1996.

Iowa Wildlife Management (IAN 401); Iowa Wildlife and People Series; 1996.

Keeping Iowa Wildlife Wild (IAN 402); Iowa Wildlife and People Series; 1996.

Iowa Biodiversity (IAN 407); Iowa Wildlife and People Series; 1996.

The Wild Mammals of Missouri; Charles and Elizabeth Schwartz; University of Missouri Press; Columbia, MO; 1968.

Useful contacts

Iowa Department of Natural Resources; http://www.state.ia.us/government/dnr; or call 515-281-IDNR (4367)

Iowa State University Extension; http://www.iastate.edu/homepage.html

National Biological Information Infrastructure; http://www.nbii.gov
Provides research and information about many animal species nationwide

U.S. Geological Survey Biological Resources; http://biology.usgs.gov/species.risk
Useful information about many animal species, particularly endangered species

Bat Conservation International; http://www.batcon.org
Photographs, recent research, and interesting information about bats

County conservation boards, extension offices, natural resources conservation service offices: Consult the government section of your local telephone book.

Iowa Mammals is one in a series of six booklets that are part of the *Iowa Wildlife Series*. The booklets in the series include:

Iowa Wildlife Series

Iowa Mammals	(IAN-601)
Iowa Winter Birds	(IAN-602)
Iowa Nesting Birds	(IAN-603)
Iowa Reptiles and Amphibians	(IAN-604)
Iowa Fish	(IAN-605)
Iowa Insects and Other Invertebrates	(IAN-606)

The Iowa Association of Naturalists also has produced five other booklet series that provide readers with a clear, understandable overview of topics concerning the Iowa environment and conservation. The booklets included in each of the other five series are listed below.

Iowa's Natural Resource Heritage

Changing Land Use and Values	(IAN 501)
Famous Iowa Conservationists	(IAN 502)
Iowa's Environmental Laws	(IAN 503)

Iowa Wildlife and People

Iowa Wildlife Management	(IAN-401)
Keeping Iowa Wildlife Wild	(IAN-402)
Misconceptions About Iowa Wildlife	(IAN-403)
State Symbols of Iowa	(IAN-404)
Iowa Food Webs and Other Interrelationships	(IAN-405)
Natural Cycles In Iowa	(IAN-406)
Iowa Biodiversity	(IAN-407)
Adapting To Iowa	(IAN-408)

Iowa Plants

Iowa's Spring Wildflowers	(IAN-301)
Iowa's Summer and Fall Wildflowers	(IAN-302)
Benefits and Dangers of Iowa Plants	(IAN-303)
Iowa's Trees	(IAN-304)
Seeds, Nuts, and Fruits of Iowa Plants	(IAN-305)
Iowa's Mushrooms and Other Nonflowering Plants	(IAN-306)
Iowa's Shrubs and Vines	(IAN-307)

Iowa's Biological Communities

Iowa's Biological Communities	(IAN-201)
Iowa Woodlands	(IAN-202)
Iowa Prairies	(IAN-203)
Iowa Wetlands	(IAN-204)
Iowa Waterways	(IAN-205)

Iowa Environmental Issues

Iowa Habitat Loss and Disappearing Wildlife	(IAN-101)
Iowa Air Pollution	(IAN-102)
Iowa Water Pollution	(IAN-103)
Iowa Agricultural Practices and the Environment	(IAN-104)
People, Communities, and Their Iowa Environment	(IAN-105)
Energy In Iowa	(IAN-106)
Iowa Waste Management	(IAN-107)

These booklets are available to download via PDF on the ISU Extension Store:

store.extension.iastate.edu

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